

Bergen Community College
Division of Math, Science and Technology
Department of Physical Sciences

Master Course Syllabus
CHM-140 General Chemistry I

Semester and year:

Course Number: CHM 140-XXX

Meeting Times and Locations:

Instructor:

Office Location:

Phone:

Office Hours:

By Appointment Only

Email Address:

Students who require accommodations by the American with Disabilities Act (ADA) can request support services from the Office of Specialized Services of Bergen Community College. 201-612-5270 or <http://www.bergen.edu/pages/676.asp>.

COURSE DESCRIPTION:

CHM-140 General Chemistry I is a study of the fundamental laws and theories of chemistry. Topics covered include units of measurement, dimensional analysis, stoichiometry, aqueous reactions, thermochemistry, and electronic structure of the atom, periodicity, chemical bonding, molecular geometry and properties of gases.

CREDITS/HOURS: 3 credits/ 3 hours

PREREQUISITES: MAT-032 or MAT-035 or equivalent by an appropriate placement as a result of the New Jersey Basic Skills Placement AND CHM-100, or a passing score on the CHM-100 challenge exam.

RECOMMENDED COREQUISITE: CHM-141 AND MAT-045 are **strongly** recommended.

GENERAL ED COURSE: Yes

TEXTBOOK: Chemistry The Central Science, Brown LeMay, 14th Edition, Pearson (2018). The book is the text used for this course. Students should decide to purchase any version (print or e-book or none) as best suits their circumstances and learning needs.

Online Homework Program: This text maybe purchased with access to MasteringChemistry. This purchase option (MasteringChemistry) is for access to an on-line homework package. Students may elect for part of their grade to be determined by completing online homework. **YOU ARE URGED TO USE "GOOGLE CHROME" as your web browser to achieve the best results with mastering Chemistry.**

Late On-Line Homework. MasteringChemistry Assignments are due the day of a test. NO CREDIT is given for homework completed after the test is scheduled (which is the due date). A student may practice online for no credit after the due date.

SAMPLE LECTURE AND EXAMINATION SCHEDULE:*

Class	Day, Date	Lecture Time Slot
1.		Chapter 1
2.		Chapter 2
3.		Chapter 2 & 3
4.		Chapter 3
5.		Chapter 3
6.		Review
7.		Unit Examination 1 on Chapters 1, 2, & 4
8.		Chapter 4
9.		Chapter 4
10.		Chapter 10
11.		Chapter 10
12.		Chapter 5
13.		Chapter 5
14.		Review
15.		Unit Examination 2 on Chapters 3, 10, & 5
16.		Chapter 6
17.		Chapter 6
18.		Chapter 6 & 7
19.		Chapter 7
20.		Review
21.		Unit Examination 3 on Chapters 6 & 7
22.		Extra Day – USE AS NEEDED
23.		Chapter 8
24.		Chapter 8
25.		Chapter 9
26.		Chapter 9
27.		Review
28.		Unit Examination 4 on Chapters 8 & 9
29.		Review
30.		Final Examination (Comprehensive)

*(Assumes four Unit Examinations and a Cumulative Final Exam. An instructor may choose to give three Unit Examinations and a Cumulative Final Exam.)

GRADING POLICY:

Option A*

Grade Component I	66 to 80%
Three to Four Unit Examinations	
Grade Component II (complete one of three)	33 to 20%
Final Examinations (Comprehensive)	

Examination Score	Point Value	Letter Grade
100 – 90	4.0	A
90 – 85	3.5	B+
85 – 80	3.0	B
80 – 75	2.5	C+
75 – 70	2.0	C
70 – 60	1.0	D
60 – 0	0.0	F

COURSE CONTENT:

Chapter 1: Introduction: Matter, Energy, and Measurement

Classifying Matter and Properties
Energy and Temperature
Measurements and Significant Figures
Density
Dimensional Analysis

*These topics will be touched upon briefly in class.
Students are expected to review most of this material on their own.*

Chapter 2: Atoms, Molecules and Ions.

Atomic Theory
Subatomic Particles
Isotopes & Atomic Weight
Periodic Table
Chemical Nomenclature - (Ionic, Covalent, Acids)

Chapter 3: Chemical Reactions and Reaction Stoichiometry

Intro Chemical Equations
Types of Chemical Reactions
Avogadro's Number, Mole, Formula Weights,
Grams to Mole to Particle Conversions
% Composition & Empirical Formulas
Stoichiometry & Masses
IFC Table, Theoretical & Percent Yields, Limiting Reagents

Chapter 4: Reactions in Aqueous Solutions

Solution Definitions
Five Solubility Rules
Complete Ionic & Net Ionic Equations
Intro Acid Base Chemistry
Intro Redox Chemistry (*Using oxidation numbers to balance redox reactions is optional.*)
Concentration Problems (Scratch & Dilution)
Solution Stoichiometry

Chapter 10: Gases

Pressure and Gas Measurements
The Gas Laws (four)
Stoichiometry and Ideal Gas Law
Dalton Law of Partial Pressure
Kinetic Molecular Theory (effusion & diffusion)
Van der Waal Equation (Non-Ideal Gas Behavior) - (*Non-ideal Behavior: Real Gas Behavior is covered qualitatively only.*)

Chapter 5: Principles of Reactivity: Energy and Chemical Reactions.

- Enthalpy
- Specific Heat Capacity
- Energy and Changes of State
- Enthalpy and Measuring Heats of Reactions
- Hess's Law and Standard Enthalpies

Chapter 6: The Structure of Atoms.

- Wave Nature of Light
- Emission Spectra & Rydberg Equation
- DeBroglie Equation
- Four Quantum Numbers
- Complete Electron Configuration
- Noble Gas Electron Configuration
- Pauli, AufBau, & Hund Rules
- Orbital Box Electron Configuration

Chapter 7: Periodic Properties of the Elements

- Periodicity and the Periodic Table
- Atomic and Ionic Size
- Ionization Energy and Electron Affinity
- Metals, Nonmetals, Metalloids (optional)
- Functional Group Trends (optional)
- Electronic Spin and Magnetism

Chapter 8: Bonding and Molecular Structure

- Covalent Bonding and Lewis Dot Structures
- Bond Polarity and Electronegativity
- Formal Charge
- Resonance
- Exceptions to Octet Rule
- Bond Order
- Bond Length and Enthalpies

Chapter 9: Bonding and Molecular Structure:

- VSEPR Rules
- Electron Domain Geometry & Molecular Geometry (Shape)
- AEX Designation
- Molecular Polarity
- Valence Bond Theory
- Orbital Hybridization
- Multiple Bonds
- Molecular Orbital Theory - Optional

SUPPLEMENTARY READINGS / MATERIALS:

1. Chemistry, The Central Science, 10th Edition, Theodore L. Brown, H. Eugene LeMay Jr., and Bruce E. Bursten; Prentice Hall, New Jersey; 2006.
2. Chemistry Matter and its Changes: 4th Edition, James E. Brady, Joel W. Russell, and John R. Holum; John Wiley and Sons Inc., New Jersey; 2004.
3. Chemistry, 9th Edition, Raymond Chang; McGraw Hill, New York; 2007.
4. Chemistry, 5th Edition, John McMurry and Robert C. Fay; Prentice Hall, New Jersey; 2008.
5. General Chemistry, 8th Edition: Darrell D. Ebbing and Steven D. Gammon; Houghton Mifflin; Boston; 2004.
6. Chemistry: The Molecular Science, 2nd Edition, John W. Moore, Conrad L. Stanitski, and Peter C. Jurs; Brooks/Cole, Thomson Learning, California; 2005.

OTHER REQUIREMENTS AND POLICIES:

1. A calculator is required.
 - Calculators attached to cellular telephones may not be used during exams.
 - Complex (graphing) calculators with memory are prohibited.
2. I-Phones & Cell Phone may never be taken out during tests. Turn them off.
3. A pair of safety glasses will be required when working in the laboratory.
4. The use of portable electronic devices such as pagers and cellular telephones is not permitted while class is in session. Students carrying such devices should silence them before entering the classroom or laboratory.
5. Calculators will be required for the course and students are responsible for bringing a calculator to all quizzes, exams, and laboratory classes. The calculators used for exams cannot be calculators attached to cellular telephones or graphing calculators.

ATTENDANCE/LATENESS POLICY:

All students are expected to attend punctually every scheduled meeting of each course in
All students are expected to attend every meeting of the course. Students are expected to be on time for class and to remain in class until the end of the class. Students should anticipate that their final grade will be lower by one letter grade for every two days of class that they miss. While the policy will not be enforced by the instructor, student should anticipate this result from their sheer lack of knowledge. Attendance will be kept by the instructor for administrative and counseling purposes.

Students who are late to the laboratory class and have missed the instructions, including safety, for the laboratory experiment may be refused permission to perform the experiment.

STUDENT LEARNING OBJECTIVES: As a result of meeting the requirements in this course, students will be able to:

1. Use metric units.
2. Develop and use conversion factors to solve problems.
3. Write names and formulas for inorganic compounds.
4. Identify and name acids, bases, salts and oxides.
5. Solve stoichiometry problems.
6. Apply the empirical gas laws.
7. Explain and interpret the kinetic theory of gases.
8. Interpret the enthalpy changes of chemical processes.
9. Explain the wave nature of light and the modern view of the atom.
10. Use the principles of quantum mechanics to predict the electron configurations of atoms and ions.
11. Explain the nature of chemical bonds.
12. Predict the three-dimensional shapes of small molecules.

Define and explain technical terms used in chemistry

STUDENT AND FACULTY SUPPORT SERVICES:

- Students experiencing difficulty with the arithmetic or problem solving aspects of this course should acquaint themselves with the services of the Tutoring Center and Smarthinking.
- The BCC Library provides extensive support services for student research.
- Faculty office hours may be a productive vehicle for assistance in understanding the course material.
- Services for Students with Disabilities: A wide variety of services are available to students with documented disabilities through the Office of Specialized Services (OSS). For further information, go to the OSS website: www.bergen.edu/oss or go to Room L116.

FACULTY ABSENCE PROCEDURE:

A daily listing of cancelled classes will appear in a glass case near the main corridor on the first floor. Another such listing will appear in a glass case in Ender Hall. Students can consult these cases before going to class. If students find a class cancelled which has not been listed, they should report this to the Divisional Dean's Office, A325, or the Evening Office L113.

All BCC students enrolled in credit courses are entitled to a WebAdvisor account. With WebAdvisor, you may register online, pay your bill, check your schedule, room assignments, GPA, and find out what courses you need to take. To find out more about WebAdvisor or to sign up online, visit <http://go.bergen.edu>! While there, please make sure you give us your preferred email address. You'll find directions how to do this at <http://go.bergen.edu/email>.

Include the last page if you are using MOODLE with your class.



Bergen Community College
Distance Learning Education
400 Paramus Road, Rm. C-328
Paramus, New Jersey 07652
psimms@bergen.edu

Web Enhanced Course Entry Information

August 8, 2018

Dear Student,

Welcome to the online community at Bergen Community College. You have registered for a Web Enhanced course. This letter provides you with important information and instructions you will need to gain access to WebCT for the online segment of your course.

To enter go to: moodle.bergen.edu and enter your username and password and click **Login**. You must log into your course using the following guidelines for your username and password. ***This is the only way you can enter your course – you cannot change your username or password or you will not be able to log in.***

- 1) Your user name is the same as your WebAdvisor username.
- 2) Your password is up to first 8 letters of your last name followed by last 4 digits of your BCC ID. Type the first initial of your last name in uppercase. Example: John **O'Shaughnessy** & BCC ID# 107**1234** = **Oshaughn1234**.

You can access your course from the **Courses AvailableTo You** block. Click the **+** sign to expand the term and you will find your course(s).

Unless you are on campus, you are responsible for supporting your own Internet access and email account throughout the course.

If after following these instructions you still have difficulty logging in, please call the help desk at **1-877-612-5381**.

We hope you find your experience to be a productive and enjoyable one.

Please email us at citl@bergen.edu with suggestions to better serve you and the online learning community at Bergen Community College.